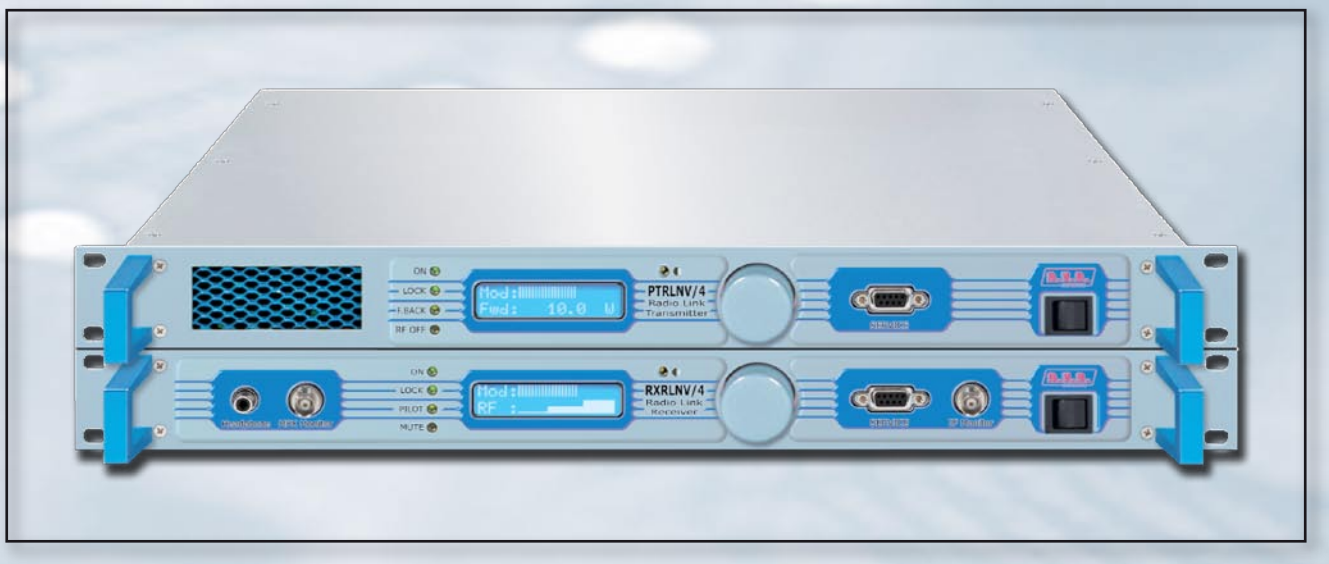
R.V.R. ELETTRONICA

PTRLNV/4 & RXRLNV/4

USER MANUAL

VOLUME1



BROADCAST EQUIPMENT

Manufactured by R.V.R ELETTRONICA S.p.A. Italy

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PTRLNV/4 & RXRLNV/4 - User Manual
Version 1.0

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Notification of intended purpose and limitations of product use
This product is a FM transmitter intended for FM audio broadcasting. It utilises operating frequencies not harmonised in the intended countries of use.
The user must obtain a license before using the product in intended country of use. Ensure respective country licensing requirements are complied with.
Limitations of use can apply in respect of operating freuency, transmitter power and/or channel spacing.

Declaration of Conformity
Hereby, R.V.R. Elettronica SpA, declares that this FM transmitter is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

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IMPORTANT

The symbol of lightning inside a triangle placed on the product, evidences the operations for which is necessary gave it full attention to avoid risk of electric shocks.

The symbol of exclamation mark inside a triangle placed on the product, informs the user about the presence of instructions inside the manual that accompanies the equipment, important for the efficacy and the maintenance (repairs).

1. Preliminary Instructions

• General Warnings

This equipment should only be operated, installed and maintained by "trained" or "qualified" personnel who are familiar with risks involved in working on electric and electronic circuits. "Trained" means personnel who have technical knowledge of equipment operation and who are responsible for their own safety and that of other unqualified personnel placed under their supervision when working on the equipment.
"Qualified" means personnel who are trained in and experienced with equipment operation and who are responsible for their own safety and that of other unqualified personnel placed under their supervision when working on the equipment.

WARNING: Residual voltage may be present inside the equipment even when the ON/OFF switch is set to Off. Before servicing the equipment, disconnect the power cord or switch off the main power panel and make sure the safety earth connection is connected. Some service situations may require inspecting the equipment with live circuits. Only trained and qualified personnel may work on the equipment live and shall be assisted by a trained person who shall keep ready to disconnect power supply at need.

R.V.R. Elettronica S.p.A. shall not be liable for injury to persons or damage to property resulting from improper use or operation by trained/untrained and qualified/unqualified persons.

WARNING: The equipment is not water resistant. Any water entering the enclosure might impair proper operation. To prevent the risk of electrical shock or fire, do not expose this equipment to rain, dripping or moisture.

Please observe local codes and fire prevention rules when installing and operating this equipment.

WARNING: This equipment contains exposed live parts involving an electrical shock hazard. Always disconnect power supply before removing any covers or other parts of the equipment.

Ventilation slits and holes are provided to ensure reliable operation and prevent overheating; do not obstruct or cover these slits. Do not obstruct the ventilation slits under any circumstances. The product must not be incorporated in a rack unless adequate ventilation is provided or the manufacturer's instructions are followed closely.

WARNING: This equipment can radiate radiofrequency energy and, if not installed in compliance with manual instructions and applicable regulations, may cause interference with radio communications.

WARNING: This equipment is fitted with earth connections both in the power cord and for the chassis. Make sure both are properly connected.

Operation of this equipment in a residential area may cause radio interference, in which case the user may be required to take adequate measures.

The specifications and data contained herein are provided for information only and are subject to changes without prior notice. **R.V.R. Elettronica S.p.A.** disclaims all warranties, express or implied.While R.V.R. Elettronica S.p.A. attempts to provide accurate information, it cannot accept responsibility or liability for any errors or inaccuracies in this manual, including the products and the software described herein. **R.V.R. Elettronica S.p.A.** reserves the right to make changes to equipment design and/or specifications and to this manual at any time without prior notice.

• Notice concerning product intended purpose and use limitations.

This product is a radio transmitter suitable for frequency-modulation audio radio broadcasting. Its operating frequencies are not harmonised in designated user countries. Before operating this equipment, user must obtain a licence to use radio spectrum from the competent authority in the designated user country. Operating frequency, transmitter power and other characteristics of the transmission system are subject to restrictions as specified in the licence.

2. Warranty

La **R.V.R. Elettronica S.p.A.** warrants this product to be free from defects in workmanship and its proper operation subject to the limitations set forth in the supplied Terms and Conditions. Please read the Terms and Conditions carefully, as purchase of the product or acceptance of the order acknowledgement imply acceptance of the Terms and Conditions. For the latest updated terms and conditions, please visit our web site at WWW.RVR.IT. The web site may be modified, removed or updated for any reason whatsoever without prior notice. The warranty will become null and void in the event the product enclosure is opened, the product is physically damaged, is repaired by unauthorised persons or is used for purposes other than its intended use, as well as in the event of improper use, unauthorised changes or neglect.
In the event a defect is found, follow this procedure:

1 Contact the seller or distributor who sold the equipment; provide a description of the problem or malfunction for the event a quick fix is available.

Sellers and Distributors can provide the necessary information to troubleshoot the most frequently encountered problems. Normally, Sellers and Distributors can offer a faster repair service than the Manufacturer would. Please note that Sellers can pinpoint problems due to wrong installation.

2 If your Seller cannot help you, contact **R.V.R. Elettronica S.p.A.** and describe the problem; if our staff deems it appropriate, you will receive an authorisation to return the equipment along with suitable instructions;

3 When you have received the authorisation, you may return the unit. Pack the unit carefully before shipment; use the original packaging whenever possible and seal the package perfectly. The customer bears all risks of loss (i.e., R.V.R. shall not be liable for loss or damage) until the package reaches the R.V.R. factory. For this reason, we recommend insuring the goods for their full value. Returns must be sent on a C.I.F. basis (PREPAID) to the address stated on the authorisation as specified by the R.V.R. Service Manager.

Units returned without a return authorisation may be rejected and sent back to the sender.

4 Be sure to include a detailed report mentioning all problems you have found and copy of your original invoice (to show when the warranty period began) with the shipment.

Please send spare and warranty replacement parts orders to the address provided below. Make sure to specify equipment model and serial number, as well as part description and quantity.

R.V.R. Elettronica S.p.A.
Via del Fonditore, 2/2c
40138 BOLOGNA ITALY
Tel. +39 051 6010506

3. First Aid

All personnel engaged in equipment installation, operation and maintenance must be familiar with first aid procedures and routines.

3.1 Electric shock treatment

3.1.1 If the victim is unconscious

Follow the first aid procedures outlined below.

- Lay the victim down on his/her back on a firm surface.
- the neck and tilt the head backwards to free the airway system (**Figure 1**).

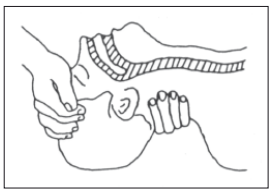


Figure 1

- If needed, open the victim's mouth and check for breathing.
- If there is no breathing, start artificial respiration without delay (**Figure 2**) as follows: tilt the head backwards, pinch the nostrils, seal your mouth around the victim's mouth and give four fast rescue breaths.

Figure 2

- Check for heartbeat (**Figure 3**); if there is no heartbeat, begin chest compressions immediately (**Figure 4**) placing your hands in the centre of the victim's chest (**Figure 5**).

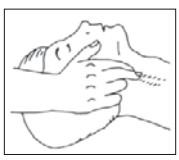


Figure 3

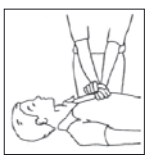


Figure 4

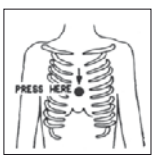


Figure 5

- One rescuer: give 2 quick rescue breaths after each 15 compressions.
- Two rescuers: one rescue breath after each 5 compressions.
- Do not stop chest compressions while giving artificial breathing.
- Call for medical help as soon as possible.

3.1.2 If the victim is conscious

- Cover victim with a blanket.
- Try to reassure the victim.
- Loosen the victim's clothing and have him/her lie down.
- Call for medical help as soon as possible.

3.2 Treatment of electric burns

3.2.1 Large burns and broken skin

- Cover affected area with a clean cloth or linen.
- Do not break any blisters that have formed; remove any clothing or fabric that is stuck to the skin; apply adequate ointment.
- Administer adequate treatment for the type of accident.
- Get the victim to a hospital as quickly as possible.
- Elevate arms and legs if injured.

If medical help is not available within an hour, the victim is conscious and is not retching, administer a solution of table salt and baking soda (one teaspoon of table salt to half teaspoon of baking soda every 250 ml of water).

Have the victim slowly drink half a glass of solution for four times during a period of 15 minutes.

Stop at the first sign of retching.

Do not administer alcoholic beverages.

3.2.2 Minor burns

- Apply cold (not ice cold) strips of gauze or dress wound with clean cloth.
- Do not break any blisters that have formed; remove any clothing or fabric that is stuck to the skin; apply adequate ointment.
- If needed, have the victim change into clean, dry clothing.
- Administer adequate treatment for the type of accident.
- Get the victim to a hospital as quickly as possible.
- Elevate arms and legs if injured.

4. General Description

The **PTRLNV/4** and **RXRLNV/4** are, respectively a broadband radio transmitter and receiver for the transport of audio signals as an auxiliary to the frequency modulation sound broadcasting.

This type of equipment is often called STL (Studio-to-Transmitter Link).

The **PTRLNV/4** is designed to work in an optimum way when connected to the receiver **RXRLNV/4**.

Externally, it is a box to mount in a 19” rack, each one being 1HE high.

4.1 Unpacking

The **PTRLNV**

The package contains:

- 1 **PTRLNV/4** and/or **RXRLNV/4**
- 1 User Manual
- 1 Mains power cable

The following accessories are also available from Your R.V.R. Dealer:

- **Accessories, spare parts and cables**

4.2 Features

The standard working frequency bands are the following:

- 1500-1525 MHz (25KHz steps)
- 1650-1680 MHz (25KHz steps)
- 1675-1725 MHz (25KHz steps)
- 1700-1750 MHz (25KHz steps)
- 1750-1800 MHz (25KHz steps)
- 2368-2372 MHz (25KHz steps)
- 2440-2450 MHz (25KHz steps)
- 2468-2483 MHz (25KHz steps)

Note: the working frequency (and therefore the band) should be indicated when the order for such product is placed.

WARNING: upon request, these links are available at other frequency bands and steps, please contactact RVR in order to check the availability of modules at the required frequency.

The **PTRLNV/4** is available with internal stereo coder which can guarantee an optimum stereophonic separation as well as a low level of harmonic distorsion. In function of your own requirements it can be configurated for the functioning under the Mono/MPX mode (that is to say when excluding the stereo coder and when using the “left” inputs as a “mono” input or the BNC, which is always on, as “MPX”). The configuration can be done by the user with the help of software. It has also two inputs (SCA1 and SCA2) for signals which are modulated on sub-carriers by appropriated external coders, normally used in Europe for the RDS transmission (Radio Data System).

In the standard version of the **RXRLNV/4**, the demodulated signal is available in the MPX form (that is to say the complete basis signal band) and in the mono version.

Moreover there are two connectors used for the respective SCA outputs. As an option, the **RXRLNV/4** can be equipped with a stereo decoder option. Also when this option is present, apart from the outputs for the LEFT and RIGHT channels, the outputs for the MPX signal are present and for the possible sub-carriers.

The important audio characteristics of this equipment are the low distorsion and intermodulation values and the high S/N level; another important quality both of the **PTRLNV/4** and the **RXRLNV/4** is its very simple construction and its easy use.

Both the **PTRLNV/4** and the **RXRLNV/4** were designed in a modular way: the different functions are executed by modules connected directly with male and female connectors or with flat cables with connectors at both ends. This type of design makes the maintenance and the possible replacement of modules an easy operation.

The microprocessor system includes an LCD display and an encoder that enable the interaction with the user, and implements the following functions for the transmitter:

- Display of the modulation
- Setting of the output power
- Setting of the working frequency
- Power Good feature (User-selectable output power alarm threshold).
- Measurement and display of the working parameters of the transmitter

These functions are implemented for the receiver:

- Display of the modulation
- Setting of the working frequency
- Setting of the muting threshold
- Measurement and display of the working parameters of the receiver

The system of the management software is composed of several menus.

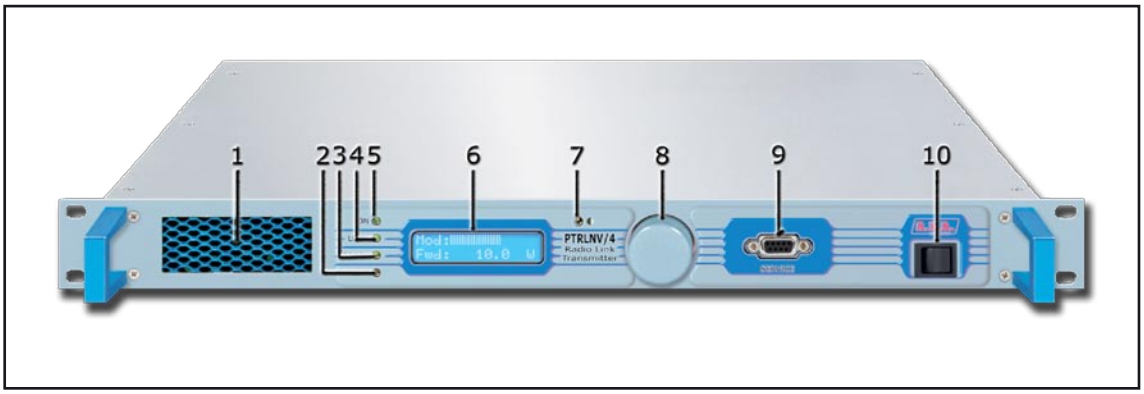
The user can navigate between the different submenus by using the knob.

The status of the unit is indicated by four LEDs which are present on the front pannel:

- ON, LOCK, FOLDBACK, RF OFF for the **PTRLNV/4**.
- ON, LOCK, PILOT, MUTE for the **RXRLNV/4**.

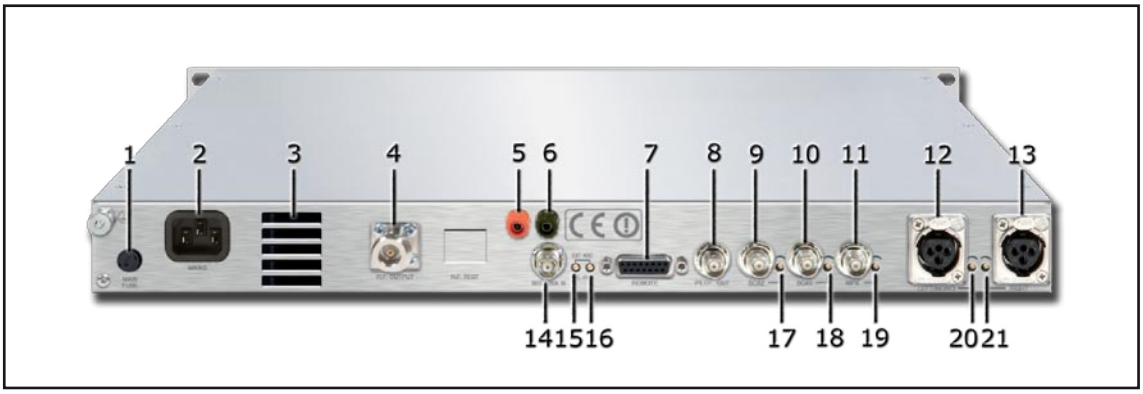
Both the transmitter and the receiver have an input for the external 24 Vcc supply. This auxiliary supply source, that can be realized by the user with the help of rescue batteries, is automatically used in case of AC voltage absence.

4.3 PTRLNV/4 Frontal Panel Description



[1]	AIR FLOW	Grid for the passage of the air flow of the forced ventilation.
[2]	RF OFF	Yellow LED, lit when the transmitter's power output is inhibited by an external interlock command.
[3]	F.BACK	Yellow LED, lit when the foldback function is operating (automatic reduction of the delivered RF power).
[4]	LOCK	Green led, lit when the PLL is locked on the working frequency.
[5]	ON	Green LED, lit when the transmitter is in RF ON.
[6]	DISPLAY	Liquid crystal display.
[7]	CONTRAST	Display contrast adjusting trimmer.
[8]	ENCODER	Knob and button in order to software control.
[9]	SERVICE	DB9 connector for factory parameters programming.
[10]	POWER	ON/OFF switch. It switches off the exciter without disconnecting the AC supply.

4.4 PTRLNV/4 Rear Panel Description

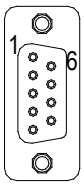


[1]	MAIN FUSE	Fuse for mains supply.
[2]	MAINS	Standard IEC connector for mains supply 90 ÷ 260 V, +10/-15%.
[3]	AIR FLOW	Grid for the passage of the air flow of the forced ventilation.
[4]	R.F. OUT	RF output connector, N-type.
[5]	24 VDC IN RED	Positive connectors for the external 24V supply.
[6]	24 VDC IN BLACK	Negative connectors for the external 24V supply.
[7]	REMOTE	DB15 connector to telemetry the equipment.
[8]	PILOT OUT	BNC output for the pilot tone. This can be used for external devices synchronization (e.g. RDS coders).
[9]	SCA 2	BNCconnector, for SCA2 input.
[10]	SCA 1	BNCconnector, for SCA1 input.
[11]	MPX	BNCconnector, for MPX input.
[12]	LEFT-MONO	XLR connector, for balanced LEFT-MONO channel input.
[13]	RIGHT	XLR connector, for balanced RIGHT channel input.
[14]	INTERLOCK IN	BNC input interlock connector: the exciter is forced in stand-by mode when the inner conductor is grounded.
[15]	FWD EXT. AGC	Trimmer to control the limitation on delivered power in function of the FWD fold input (REMOTE connector).
[16]	RFL EXT. AGC	Trimmer to control the limitation on delivered power in function of the RFL fold input (REMOTE connector).
[17]	SCA2 ADJ	Adjustment trimmer, for SCA2 input.
[18]	SCA1 ADJ	Adjustment trimmer, for SCA1 input.
[19]	MPX ADJ	Adjustment trimmer, for MPX input.
[20]	LEFT-MONO ADJ	Adjustment trimmer for the LEFT-MONO channel input.
[21]	RIGHT ADJ	Adjustment trimmer for the RIGHT channel input.

4.5 PTRLNV/4 Connector Description

4.5.1 Service (to program of factory parameters)

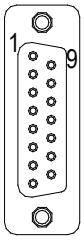
Type: DB9 Female



1	NC
2	TX_D
3	RX_D
4	Internally connected with 6
5	GND
6	Internally connected with 4
7	Internally connected with 8
8	Internally connected with 7
9	NC

4.5.2 Remote

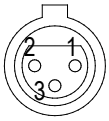
Type: DB15 Female



Pin	Name	Type	Meaning
1	Interlock	IN	Pull-up 5V (if GND then RF MUTE)
2	FWD Foldback	IN	Ext. signal,1÷12V, for power limitation (AGC)
3	GND		GND
4	SDA IIC	IN/OUT	IIC communication serial data
5	VPA Tlm	OUT	3,9V P.F.S.
6	FWD tlm	OUT	3,9V P.F.S.
7	Power Good	OUT	Open or closed relay collector selectable, enabled when power exceeds the set threshold.
8	GND		GND
9	GND		GND
10	RFL Foldback	IN	Ext. signal, 1÷12V, for power limitation (AGC)
11	SCL IIC	IN	IIC communication clock
12	IPA Tlm	OUT	3,9V P.F.S.
13	RFL Tlm	OUT	3,9V P.F.S..
14	On cmd	IN	Pull-up 5V(one grounded pulse of 500ms enables power supply
15	OFF cmd	IN	Pull-up 5V(one grounded pulse of 500ms disables power supply

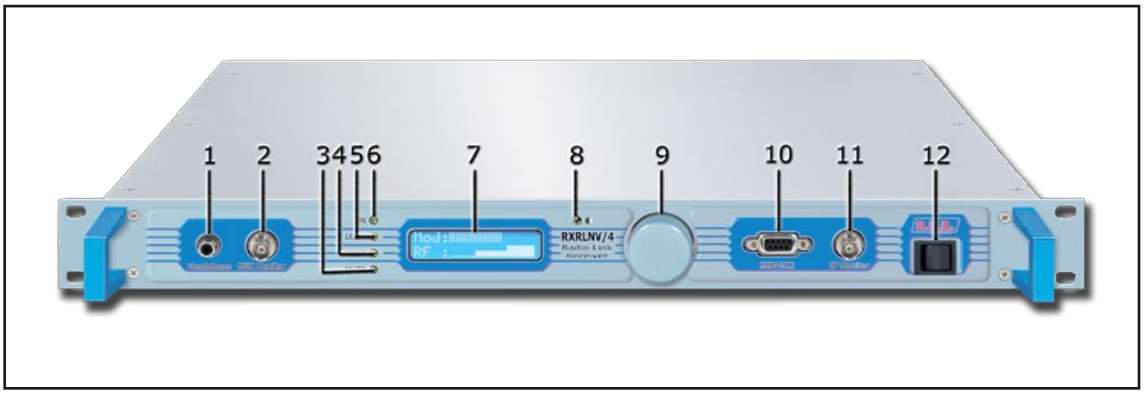
4.5.3 Left (MONO) & Right

Type: XLR Female



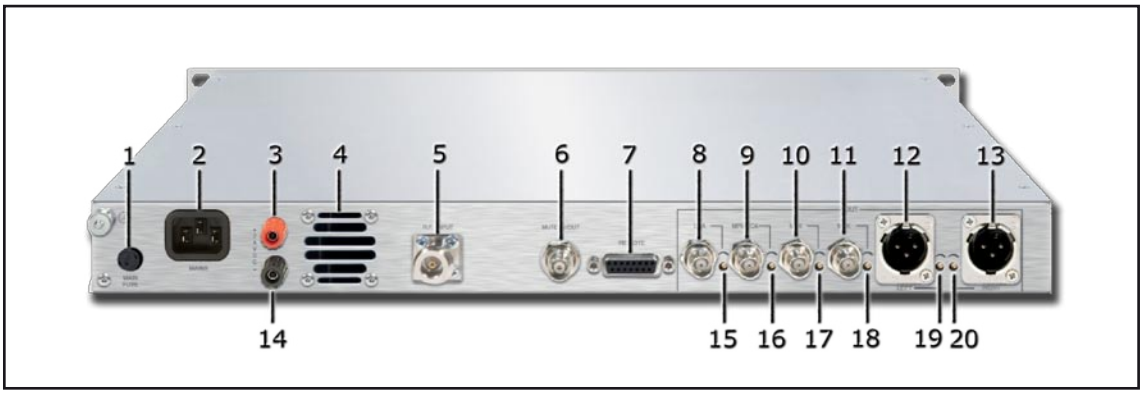
1	GND
2	Positive
3	Negative

4.6 RXRLNV/4 Frontal Panel Description



[1]	HEADPHONE	Jack plug for phone output.
[2]	MPX MONITOR	MPX Output Monitor BNC connector
[3]	MUTE	Yellow LED, lit on when the muting is activated, which means that the RF input signal has decreased under the defined threshold.
[4]	PILOT	Green LED, lit on in the version with stereo decoder option, in presence of pilot tone. In the version without decoder it is always lit off.
[5]	LOCK	Green led, lit on when the PLL is locked on the working frequency.
[6]	ON	Green LED, lit on when the receiver is working.
[7]	DISPLAY	Liquid crystal display.
[8]	CONTRAST	Display contrast adjusting trimmer.
[9]	ENCODER	Knob and button in order to software control.
[10]	SERVICE	DB9 connector for factory parameters programming.
[11]	IF MONITOR	BNC output connector for the 10.7 MHz sampling for tests.
[12]	POWER	ON/OFF switch. It switches off the exciter without disconnecting the AC supply.

4.7 RXRLNV/4 Rear Panel Description

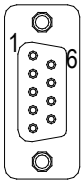


[1]	MAIN FUSE	Fuse for mains supply.
[2]	MAINS	Standard IEC connector for mains supply 90 ÷ 260 V, +10/-15%.
[3]	24 VDC IN RED	Positive connectors for the external 24V supply.
[4]	AIR FLOW	Grid for the passage of the air flow of the forced ventilation.
[5]	R.F. INPUT	RF input connector, N-type.
[6]	MUTE IN/OUT	BNC interlock connector. If it is set as MUTE IN: muting of the audio outputs with an external command. If it is set as MUTE OUT (default): follows the MUTE LED, lit on when contact is open or closed (internally selectable).
[7]	REMOTE	DB15 connector to telemetry the equipment.
[8]	SCA	BNC connector, for the unbalanced SCA output.
[9]	MPX/SCA	BNC connector, for the unbalanced MPX or SCA output.
[10]	MPX	BNC connector, for the unbalanced MPX output.
[11]	MPX	BNC connector, for the unbalanced MPX output.
[12]	LEFT	XLR connector, for balanced LEFT/MONO channel output.
[13]	RIGHT	XLR connector, for balanced RIGHT channel output.
[14]	24 VDC IN BLACK	Negative connectors for the external 24V supply.
[15]	SCA ADJ	Adjustment trimmer, for SCA output.
[16]	MPX/SCA ADJ	Adjustment trimmer, for MPX/SCAoutput.
[17]	MPX ADJ	Adjustment trimmer, for MPX output.
[18]	MPX ADJ	Adjustment trimmer, for MPX output.
[19]	LEFT ADJ	Adjustment trimmer for the LEFT/MONO channel output.
[20]	RIGHT ADJ	Adjustment trimmer for the RIGHT channel output.

4.8 RXRLNV/4 Connector Description

4.8.1 Service (to program of factory parameters)

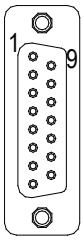
Type: DB9 Female



1	NC
2	TX_D
3	RX_D
4	Internally connected with 6
5	GND
6	Internally connected with 4
7	Internally connected with 8
8	Internally connected with 7
9	NC

4.8.2 Remote

Type: DB15 Female



Pin	Name	Type	Meaning
1	Audio OFF	IN	Pull-up 5V(if grounded, it inhibits the Audio)
2	N.C.		
3	GND		GND
4	SDA IIC	IN/OUT	IIC communication serial data
5	RF Input Level	OUT	4V P.F.S. (R.S.S.I.)
6	LEFT Output Level	OUT	2V F.S .
7	Muting TLS	OUT	Open or closed relay collector selectable, contact to GND
8	GND		GND
9	GND		GND
10	N.C.		
11	SCL IIC	IN	IIC communication clock
12	MPX Output Level	OUT	2V F.S.
13	RIGHT Output Level	OUT	2V F.S.
14	N.C.		
15	N.C.		

4.8.3 Left (MONO) & Right

Type: XLR Male

1	GND
2	Positive
3	Negative

4.9 Technical Description

Parameters	PTRLNV/4	RXRLNV/4
GENERALS		
Rated output power	5 W (1.6 GHz) or 2/5 W (2.4 GHz)	
Frequency range	1.500-1.525 MHz; 1.650-1.680 M; 1.700-1.750 MHz; 1.750-1.800 MHz; 2.360-2.400 M; 2.400-2.440 MHz; 2.440-2.484 MHz (max 25 MHz band) Other frequencies available on request	
Operational Mode	Mono, Stereo, Multiplex	
Modulation type	Direct carrier frequency modulation	
Primary Power	80 ÷ 260 VAC or 24 VDC	
AC power Consumption	50VA	25VA
Phisical Dimensions (W x H x D)	483 x 88 x 325 mm	
Weight	6 kg	5 kg
Environmental working temperature	-10 ÷50 °C / 95% relative Humidity non condensing	
Frequency stability	±1 ppm	
Asynchronous AM S/N ratio	≥60 dB	
Synchronous AM S/N ratio	≥50 dB	
Preemphasis	0/50 (CCIR) µS, 75 (FCC) µS selectable by software	
MONO/MPX OPERATION		
S/N FM Ratio	>75 dB (1600MHz); >70 dB (2400 MHz)	
Frequency Response	± 0.1 dB (40 Hz ÷ 100kHz)	
Total Harmonic Distortion	≤ 0.1 %	
OPTIONAL INTERNAL STEREO CODER OPERATION		
S/N FM Ratio	>72 dB (1500 ÷ 1800MHz); >67 dB (2300 ÷ 2400 MHz)	
Frequency Response	± 0.1 dB (40 Hz ÷ 100kHz)	
Total Harmonic Distortion	≤ 0.1 %	
Stereo separation	>50 dB	
AUDIO INPUTS / OUTPUTS		
Left-Mono	XLR F balanced Impedance: 10 k ohm Level: -13÷ +13 dB	XLR M balanced Impedance: 100 ohm Level: -10÷ +12 dBu
Right	XLR F balanced Impedance: 10 k ohm Level: -13÷ +13 dB	XLR M balanced Impedance: 100 ohm Level: -10÷ +12 dBu
MPX unbalanced/RDS	BNC unbalanced Impedance: 10 k or 50 ohm Level: -13÷ +13 dBu	BNC unbalanced Impedance: 100 ohm Level: -10÷ +7 dBu
MPX Monitor		0 dBu
SCA	BNC unbalanced Impedance: 10 k ohm Level: -13÷ +13 dBu	BNC unbalanced Impedance: 100 ohm Level: -10÷ +7 dBu
MPX unbalanced/RDS	BNC unbalanced Impedance: 10 k or 50 ohm Level: -13÷ +13 dBu	BNC unbalanced Impedance: 100 ohm Level: -10÷ +7 dBu
OTHER CONNECTIONS		
RF output / input	N (50 ohm)	
RF Monitor	BNC; Level: 0 ÷ +10 dBm	
IF Monitor		BNC; Lvl: -5 dBm; Freq: 10,7 MHz
MPX Monitor		BNC
Interlock in	BNC - DB15	
Interlock out / Mute		BNC - DB15
Stereo headphone		Jack 6,3 mm
VERSIONS		
PTRLNV/4.1500-1525	LCD Radio Link transmitter 1490-1600 MHz	
RXRLNV/4.1500-1525		LCD Radio link receiver 1490-1600 MHz
PTRLNV/4.1650-1680	LCD Radio Link transmitter 1600-1700 MHz	
RXRLNV/4.1650-1680		LCD Radio link receiver 1600-1700 MHz
PTRLNV/4.1675-1725	LCD Radio Link transmitter 1600-1700 MHz	
RXRLNV/4.1675-1725		LCD Radio link receiver 1600-1700 MHz
PTRLNV/4.1700-1750	LCD Radio Link transmitter 1700-1750 MHz	
RXRLNV/4.1700-1750		LCD Radio link receiver 1700-1750 MHz
PTRLNV/4.1750-1800	LCD Radio Link transmitter 1750-1800 MHz	
RXRLNV/4.1750-1800		LCD Radio link receiver 1750-1800 MHz
PTRLNV/4.2368-2372	LCD Radio Link transmitter 2300-2500 MHz	
RXRLNV/4.2368-2372		LCD Radio link receiver 2300-2500 MHz
PTRLNV/4.2440-2450	LCD Radio Link transmitter 2300-2500 MHz	
RXRLNV/4.2440-2450		LCD Radio link receiver 2300-2500 MHz
PTRLNV/4.2468-2483	LCD Radio Link transmitter 2300-2500 MHz	
RXRLNV/4.2468-2483		LCD Radio link receiver 2300-2500 MHz
OPTIONS		
/S-PTNV4	Stereo coder card option	
/05-RXRLNV4		Stereo decoder card option
STANDARD COMPLIANCE		
Safety	EN 60215:1989 EN60215/A1:1992-07 EN60215/A2:1994-09	
EMC	EN 301 489-1 V1.4.1 (2002-08) EN 301 489-11 V1.2.1 (2002-11)	
Spectrum Optimization	EN 300 454-2 V1.1.1 (2000-08)	

5. PTRLNV/4 quick guide for installation and use

This chapter contains the necessary instructions for the installation and use of the equipment. In case some aspects are not totally clear, for instance when a user is using this equipment for the first time, we advise the new user to read carefully the entire description contained in this manual.

5.1 Preparation

Unpack the exciter and before doing any other operation, be sure it has not been damaged during transport. In particular check that all the connectors are in perfect condition.

The main fuse can be accessed from the outside on the rear panel. Extract the fuse carrier with a screwdriver to check its integrity or for replacement, if necessary. The fuse to be used is this type:

- MAIN **FUSE** 3.15 A 5x20

Check that the supply voltage value coincides with the AC voltage available.

The input supply field is of:

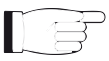
- **PTRLNV/4** 80-260 V_{AC}

Check that the **PTRLNV/4** mains switche is in the “OFF” position, it is placed on the front panel and inhibits the switching power supply of the machine.

Connect the RF output of the exciter to the antenna cable or to a dummy load able to dissipate the power generated by the **PTRLNV/4**.

Note: in case the load is not present, don’t touch the RF output connector during the equipment operation to avoid electric shock and electrocution.

Connect the mains cable to the proper standard IEC plug, placed on the rear panel.



Note: It is necessary that the mains system being provided with grounding to ensure both the operators’ safety and correct operation of the equipment.

If the user intends to use external batteries in case of AC supply interruption, connect them to the clamps situated at the back of the equipment being careful to respect the polarity.

WARNING: Keep in mind that the general switch of the transmitter has an effect on the AC supply, and not on the possible auxiliary supply. If you use an external supply with continuous current, it is then necessary to have an external switch for this purpose.

Connect the audio cable and RDS/SCA of the signal source to the proper input connectors of the **PTRLNV/4**.

5.2 Operation

Switch on the transmitter by putting the switch, located on the front panel, on the position “I” (on) .

Enter the “General Setting Menu” and set the working frequency desired.

With the help of “Audio Setting Menu”, set the characteristics (impedance, preenphasis, and possibly stereo/mono) and the levels of the audio inputs and RDS (if used).

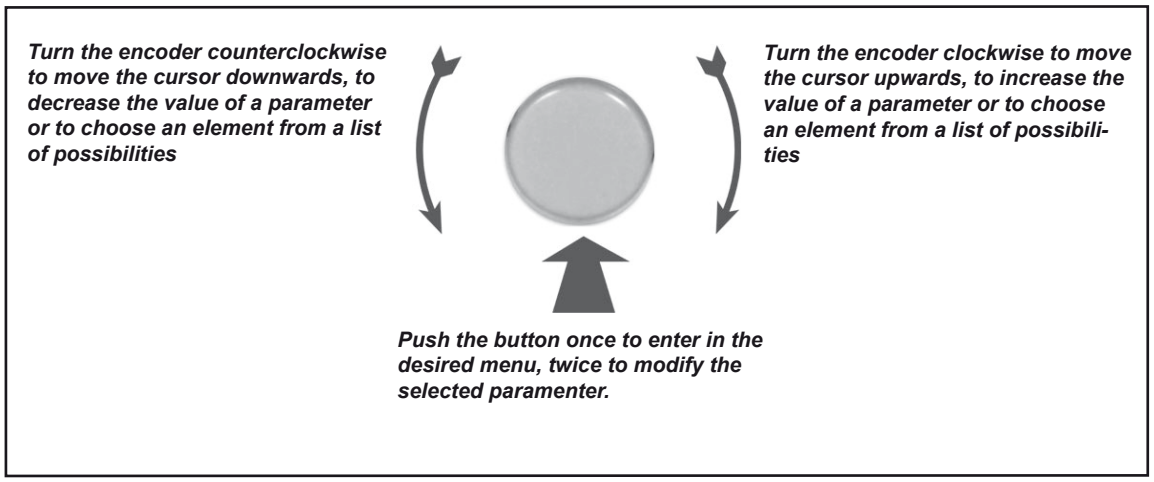
Note: by factory, it is delivery with the output power adjustment at minimum and in the “OFF” position. It is however recommended that you always check the set level before activating power supply.

Set the desired power level from the “Power Setting Menu”.

Activate the output power from the “General Setting Menu”.

5.2.1 Encoder

The interaction between the user and the transmitter control software is performed using the ENCODER.


Turn the encoder counterclockwise to move the cursor downwards, to decrease the value of a parameter or to choose an element from a list of possibilities
Turn the encoder clockwise to move the cursor upwards, to increase the value of a parameter or to choose an element from a list of possibilities
Push the button once to enter in the desired menu, twice to modify the selected paramenter.

The operations that you can perform on the ENCODER are:

- **Rotation**: moves the cursor shown on the display; if you turn the ENCODER to the left (counterclockwise), the cursor moves downwards, if you turn it right the cursor moves upwards; it also permits to increase or diminish the parameters (turning the ENCODER left diminishes the parameter.
- **Pushing**: push the button once when the cursor is on the name of a menu to enter in that menu, push it when the corsor is on the name of a parameter to enter in modification mode (the cursor starts blinking); after the modification of a parameter, push the button to save the new value.

After having modified the value of a parameter, the cursor goes on blinking for approximately 15 seconds, waiting for confirmation from the user. If the user doesn't confirm the new value (i.e., the button is not pressed), the parameter has not saved and remains on the selected parameter.

The first pressure of the ENCODER when the display is light out, or its rotation, serves in order to activate the retroillumination.

5.3 Setting and calibration

The only adjustments to have made manually on the **PTRLNV/4** are those relating to the audio operation levels and modes.

To adjusting the sensitivity level of the inputs, keep in mind that the instantaneous modulation level is given in the predefined menu and that an hatched bar signals the 75 kHz level. To get a proper adjustment, we recommend you put a level signal on the machine's output equivalent to the level of its own audio program and adjust the relative trimmer until the instantaneous deviation coincides with the indication of 75 kHz.

To adjust the levels of the inputs of the subcarriers, you can use a similar procedure while getting help from the "X10" option that can be selected from the "General Setting Menu". With this option, the modulation level indicated is multiplied by a factor 10 so the drawn indication of the predefined menu coincides with a deviation value of 7.5 kHz.

A special menu is present in which the Right and Left channel levels are indicated separately with the relative indicators of the nominal levels for the maximum deviation of 75 kHz.

The regulations of preemphasis, of impedance on L&R and MPX inputs, and of equipment operation modality are operations feasible through the menù "General Setting Menu".

5.4 Software

The machine is provided with a two-line LCD display where a set of menus is shown. An overall view of the machine's menus is given in figure .

One of the following symbols may be present on the left side of the display, depending on the case:

_ (Cursor) - The cursor indentifies the selected menu where you can have access.

▶ (Full arrow) - The parameter highlighted by the arrow can be modified. This symbol is present in menu composed of more than two lines as an help in the scroll menu.

▷▷▷ (Three empty arrows) - The parameter highlighted by the arrows is in phase of modification.

▷ (Empty Arrow) - The arrow points out the current line, the parameter of which cannot be modified. This symbol is present in the menus made up of more than two lines to help scroll the menu.

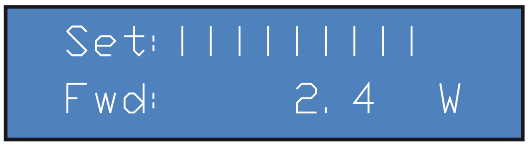
When turned on, the LCD display shows the “Main Menu” with the graphic representation of the instantaneous modulation level and indication of the forward power supplied:

Menu 1

The vertical bars under “Mod” indicate the progress of the modulation in real time; the hatched bar signals the maximum nominal modulation level at 75 kHz (100%).

To change the set power level, keep the ENCODER pressed for about 5 seconds until it enters the modification mode.

The screen that is shown in the modification mode is similar to the following:

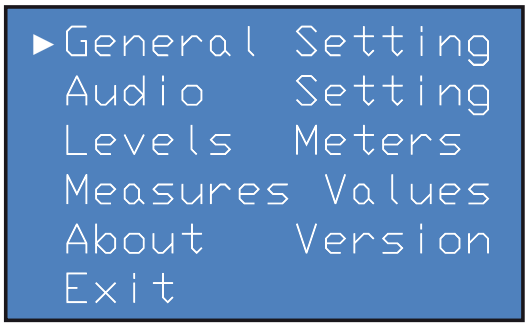


Menu 2

The bottom line gives the instantaneous reading of the power (2.4W in this example up to 5W for 1.6GHz version or 2/5W for 2.4GHz), whereas the bar indicates the set level, to increase the level rotate clockwise, to reduce it rotate counter-clockwise. When the desired level is reached, press the ENCODER to confirm and exit to the predefined menu. Note that the set value is stored anyway, so if you pass the time-out without pressing a key, the power will remain at the last set level.

The first pressure of the ENCODER when the display is light out, or its rotation, serves in order to activate the backlight.

The pressure of ENCODER when the display is switched on, while you are in the predefined menu, serves in order to shown the following selection screen from which you can access to all the other menus:



Menu 3

If you instead want to go back to the predefined menu, is sufficient select the ESC entry then push the ENCODER.

To enter into one of the submenus, select its entry (which will be underlined by a blinking cursor) with the rotation and then press the ENCODER.

Figure below shows the complete set of the equipment menus.

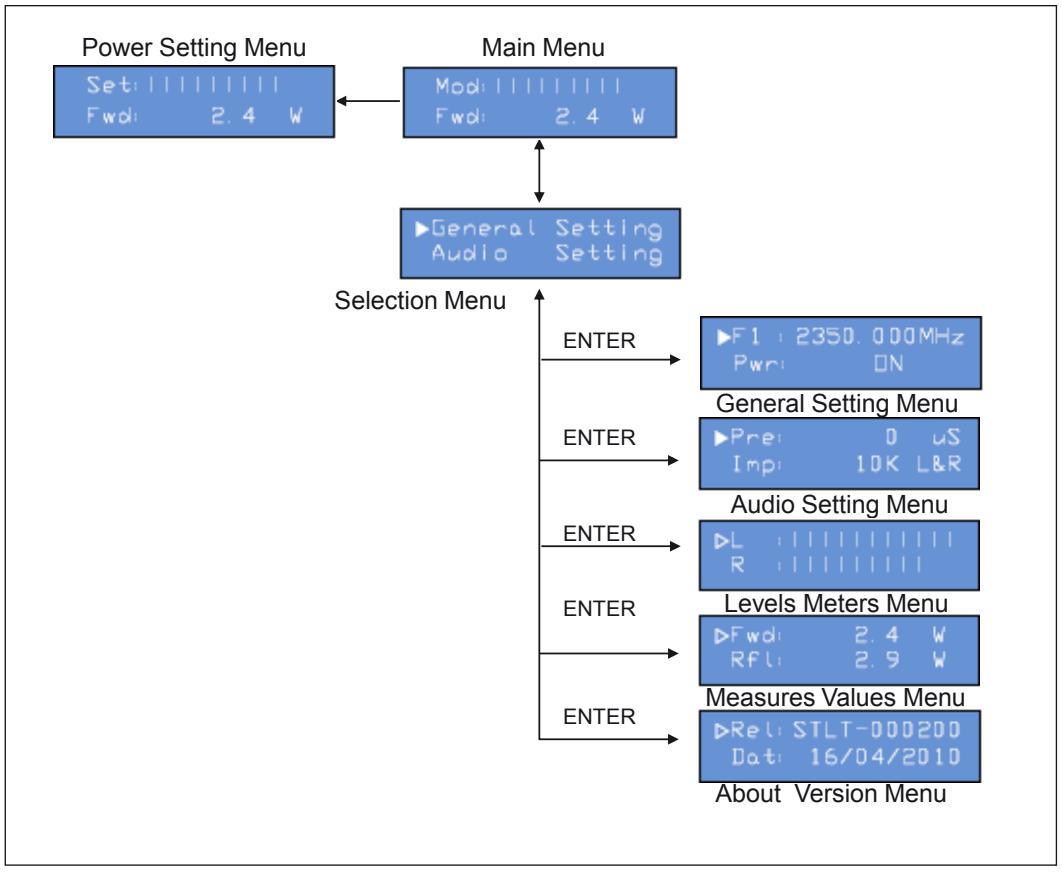
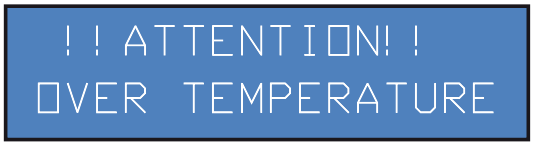


Figure 5.1

If the temperature alarm is enabled, the power supply will come inhibited in case of alarm threshold overcoming, and it will have displayed the following window only in case you are in the “Main Menu”:



Status 1

Once restored the normal operation conditions, the power supply will come rehabilitated with the same modalities antecedent the alarm.

If the modulation ran out, under 20 kHz, for a time of about 5 minutes (not modifiable) the NO AUDIO status comes displayed in the “Main Menu”, but the power does not comes inhibited:

Status 2

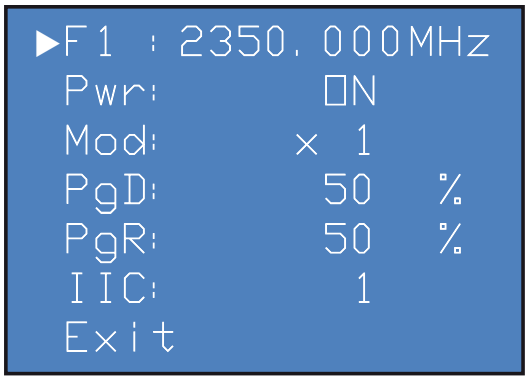
The IPA protection intervenes when the programmable “Threshold of Intervention”, expressed in mA, is exceed for a programmable number of seconds. When the alarm intervenes comes displayed in the “Main Menu” and the power is switched off.

Status 3

To restore normal operation you need to turn off the equipment.

5.4.1 General Setting Menu

From this menu the user can change frequency, enable or disable the transmitter power supply, set the deviation display modality, set up the percentage of Forward (PgD) or Reflected Power Good (PgR) and change the IIC address.



Menu 4

F1 Regulation of set up frequency. After having set a new frequency value, press the ENCODER to confirm the choice. The transmitter will release from the current frequency (the LOCK LED turns off) and it will latch onto the new operating frequency (LOCK turns back on). Instead, if you let the timeout go by, the frequency will remain set at the previous value.

Pwr Enables (On) or disables (Off) the power supply of the transmitter.

Mod Display modality of the modulation selectable between x1 and x10. The indication of the instantaneous deviation is multiplied by a factor 10 in the x10 mode, so the hatched indicator on the predefined menu will coincide with the 7.5 kHz value instead of 75 kHz. This display mode is useful when you want to view low deviation levels such as, for example, those due to the pilot tone or to the subcarriers.

PgD Regulation of the Power Good threshold relative to the forward power. The percentage value of Power Good is referred to the nominal power of the machine, that is 5W for 1.6GHz version or 2/5W for 2.4GHz, not to the supplied forward power. If a value equal to 50% is setted. The Power Good function is a control and alarm function on the supplied power. When the output power fall under the threshold value of Power Good set, the machine modifies the pin state [7] of “Remote” DB15 connector on the rear panel.

PgR Regulation of the Power Good threshold relative to the forward power. The percentage value of Power Good is referred to the nominal power of the machine not to the supplied forward power.

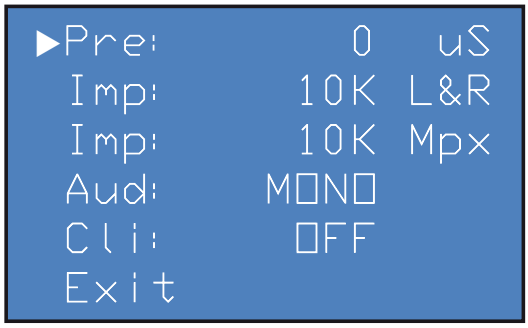
☞ **Note:** This alarm does not have effect on any output signal on the DB15 “Remote” connector, placed on the rear panel of the equipment, and it works only in presence of systems equipped of telemetry.

IIC Regulation of the I^2C address. The I^2C network address is important when the transmitter is connected to a company’s transmission system that envisages use of this protocol. We recommend you do not modify it without a good reason.

Exit — The entry allows to the user the prompt exit from current submenu and goes back to the “Main Menu”.

5.4.2 Audio Setting Menu

This menu lets to set the preemphasis, the MPX and L&R channel impedance, the audio and clipper modality.



Menu 5

Pre — Regulation of the preemphasis, selectable between 0 µs, 50 µs and 75 µs.

Imp — Regulation of the Left and Right channel input impedance, selectable between 10 kΩ or 600 Ω.

Imp — Regulation of the MPX channel input impedance, selectable between 10 kΩ or 50 Ω.

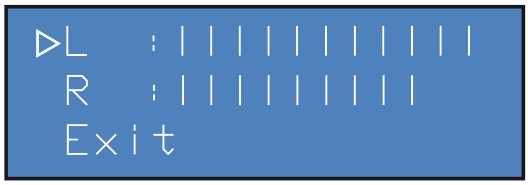
Aud — Regulation of audio modality selectable between STEREO and MONO.

Cli — Enable or disable the clipper operation.

Exit — The entry allows to the user the prompt exit from current submenu and goes back to the “Main Menu”.

5.4.3 Levels Meter Menu

The right and left channel input levels are depicted with horizontal bars, as shown in the following figure. The hatched pointer indicates the level that corresponds with the total deviation at 100%, and is useful to regulate the input levels of the audio channels.



Menu 6

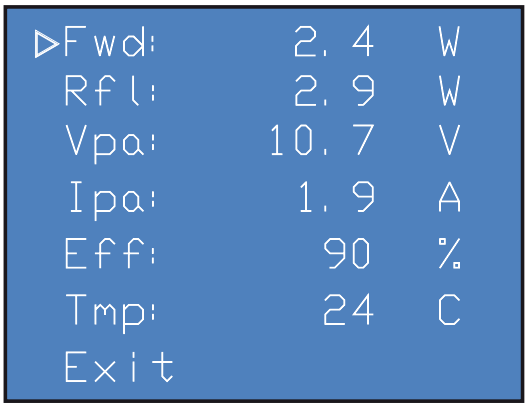
L — Visualization of the Left channel Vmeter.

R — Visualization of the Right channel Vmeter.

Exit — The entry allows to the user the prompt exit from current submenu and goes back to the “Main Menu”.

5.4.4 Measure Values Menu

This screen, consisting of several lines that can be scrolled with the rotation of the ENCODER, shows to the user the measures relating to the final power amplifier of the equipment:



Menu 7

FWD — Visualization of the set up forward power. In order to modify the power regulation, use the “Main Menu” like previously described or the “Power Setting Menu”.

RFL — Visualization of the reflected power

Vpa — Visualization of the amplifier module voltages.

Ipa — Visualization of the amplifier module current.

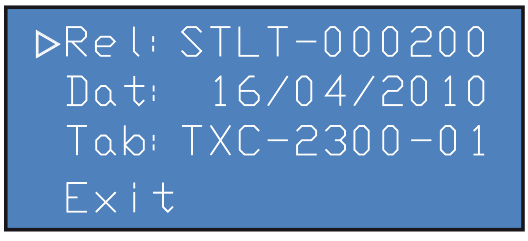
Eff — Visualization of the efficiency as ratio between the forward and reflected power of the amplifier module, expressed in percentage (FWD Pwr/(Vpa x Ipa) %).

Tmp — Visualization of the inner temperature of the machine.

Exit — The entry allows to the user the prompt exit from current submenu and goes back to the “Main Menu”.

5.4.5 About Version Menu

This screen shows the version and the release date of the software.



Menu 8

Rel — Visualization of the software release.

Dat — Visualization of the date release.

Tab — Visualization of the release of the configurations table loaded in memory.

Exit — The entry allows to the user the prompt exit from current submenu and goes back to the “Main Menu”.

6. RXRLNV/4 quick guide for installation and use

This chapter contains the necessary instructions for the installation and use of the equipment. In case some aspects are not totally clear, for instance when a user is using this equipment for the first time, we advise the new user to read carefully the entire description contained in this manual.

6.1 Preparation

Unpack the receiver and before doing any other operation, be sure it has not been damaged during transport. In particular check that all the connectors are in perfect condition.

The main fuse can be accessed from the outside on the rear panel. Extract the fuse carrier with a screwdriver to check its integrity or for replacement, if necessary. The fuse to be used is this type:

- MAIN **FUSE** 1.6 A 5x20

Check that the supply voltage value coincides with the AC voltage available.

The input supply field is of:

- **RXRLNV/4** 80-260 V_{AC}

Check that the **RXRLNV/4** mains switche is in the “OFF” position, it is placed on the front panel and inhibits the switching power supply of the machine.

Connect the RF input of the receiver to the antenna cable.

Connect the mains cable to the proper standard IEC plug, placed on the rear panel.

Note: It is necessary that the mains system being provided with grounding to ensure both the operators’ safety and correct operation of the equipment.

If the user intends to use external batteries in case of AC supply interruption, connect them to the clamps situated at the back of the equipment being careful to respect the polarity.

WARNING: Keep in mind that the general switch of the transmitter has an effect on the AC supply, and not on the possible auxiliary supply. If you use an external supply with continuous current, it is then necessary to have an external switch for this purpose.

Finally, connect the audio output of the receiver to the devices that will use it, depending on the configuration of your installation.

6.2 Operation

Switch on the receiver by putting the switch, located on the front panel, on the position “I” (on) .

Enter the “General Setting Menu” and set the working frequency desired.

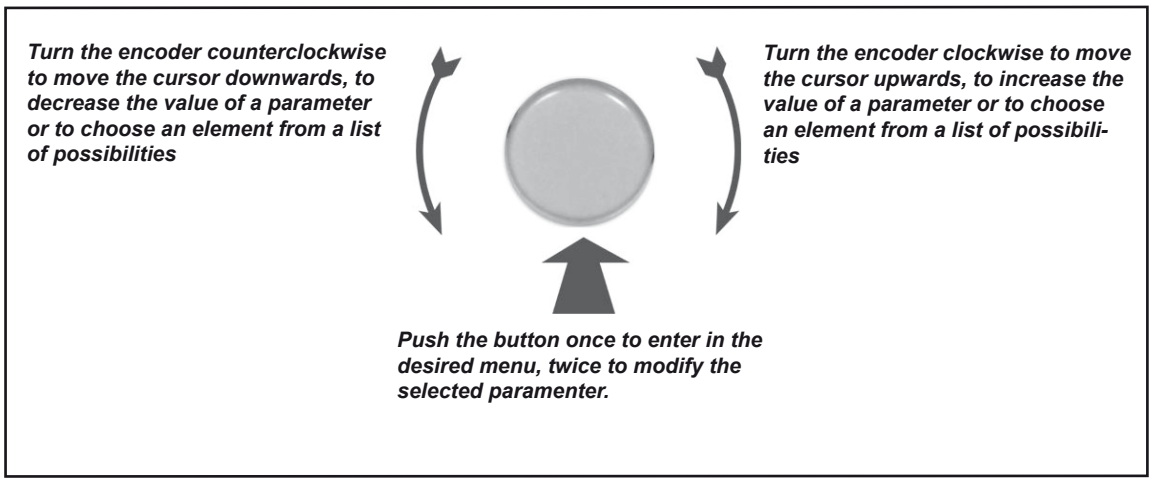
With the help of “Audio Setting Menu”, set the characteristics (deenphasis, and possibly stereo/mono) and the levels of the audio outputs.

Set the desired muting level from the “Power Setting Menu”.

Activate the audio output from the “General Setting Menu”.

6.2.1 Encoder

The interaction between the user and the transmitter control software is performed using the ENCODER.


Turn the encoder counterclockwise to move the cursor downwards, to decrease the value of a parameter or to choose an element from a list of possibilities
Turn the encoder clockwise to move the cursor upwards, to increase the value of a parameter or to choose an element from a list of possibilities
Push the button once to enter in the desired menu, twice to modify the selected paramenter.

The operations that you can perform on the ENCODER are:

- **Rotation**: moves the cursor shown on the display; if you turn the ENCODER to the left (counterclockwise), the cursor moves downwards, if you turn it clockwise the cursor moves upwards; it also permits to increase or diminish the parameters (turning the ENCODER left counter-clockwise the parameter.
- **Pushing**: push the button once when the cursor is on the name of a menu to enter in that menu, push it when the corsor is on the name of a parameter to enter in modification mode (the cursor starts blinking); after the modification of a parameter, push the button to save the new value.

After having modified the value of a parameter, the cursor goes on blinking for approximately 15 seconds, waiting for confirmation from the user. If the user doesn’t confirm the new value (i.e., the button is not pressed), the parameter has not saved and remains on the selected parameter.

The first pressure of the ENCODER when the display is light out, or its rotation, serves in order to activate the retroillumination.

6.3 Setting and calibration

The only adjustments to have made manually on the **RXRLNV/4** are those relating to the audio operation levels and modes.

When you insert the receiver in a system, you will have to adjust the level depending on your system configuration.

On the front panel there is a stereo jack plug for phone output. Above the plug, “Hpl” in “Audio Setting Menu” permits to adjust the level.

The regulations of deeemphasis, HPF filter, phase on audio signal and of equipment operation modality are operations feasible through the “Audio Setting Menu”.

6.4 Software

The machine is provided with a two-line LCD display where a set of menus is shown. An overall view of the machine’s menus is given in figure .

One of the following symbols may be present on the left side of the display, depending on the case:

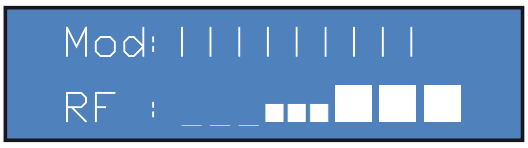
_ (Cursor) - The cursor indentifies the selected menu where you can have access.

▶ (Full arrow) - The parameter highlighted by the arrow can be modified. This symbol is present in menu composed of more than two lines as an help in the scroll menu.

▷▷▷ (Three empty arrows) - The parameter highlighted by the arrows is in phase of modification.

▷ (Empty Arrow) - The arrow points out the current line, the parameter of which cannot be modified. This symbol is present in the menus made up of more than two lines to help scroll the menu.

When turned on, the LCD display shows the “Main Menu” with the graphic representation of the instantaneous modulation level and indication of received signal:



Menu 1

The vertical bars under “Mod” indicate the progress of the modulation in real time; the hatched bar signals the maximum nominal modulation level at 75 kHz (100%).

The above line displays the instantaneous reading of the signal level received on analog scale.

To change the set muting level, keep the ENCODER pressed for about 5 seconds until it enters the modification mode.

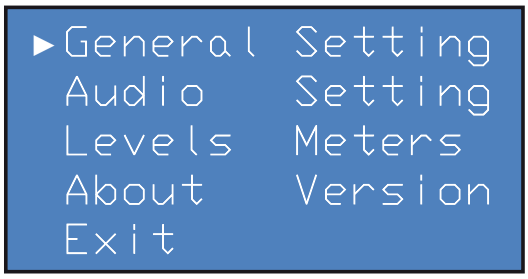
The screen that is shown in the modification mode is similar to the following:

Menu 2

The upper line is a reading of RF level, while the bottom line gives the instantaneous reading of the muting level. To increase the muting level rotate towards clockwise, to reduce it rotate towards counter-clockwise. When the desired level is reached, press the ENCODER to confirm and exit to the predefined menu. Note that the set value is stored anyway, so if you pass the time-out without pressing a key, the power will remain at the last set level.

The first pressure of the ENCODER when the display is light out, or its rotation, serves in order to activate the retroillumination.

The pressure of ENCODER when the display is switched on, while you are in the predefined menu, serves in order to shown the following selection screen from which you can access to all the other menus:



Menu 3

If you instead want to go back to the predefined menu, is sufficient select the ESC entry then push the ENCODER.

To enter into one of the submenus, select its entry (which will be underlined by a blinking cursor) with the rotation and then press the ENCODER.

Figure below shows the complete set of the equipment menus.

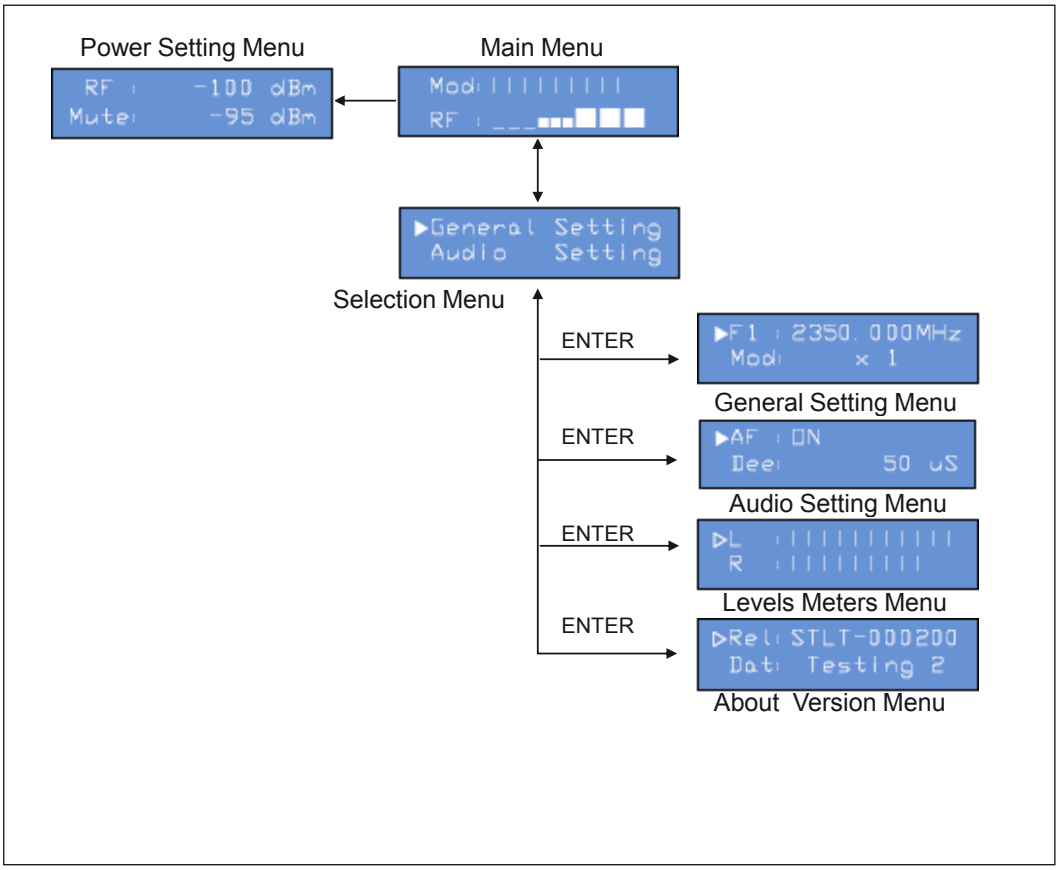
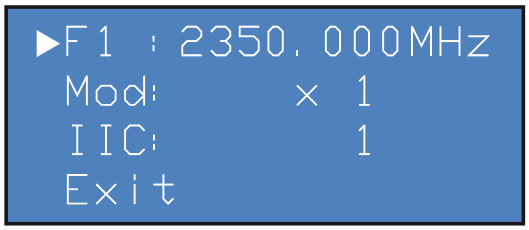


Figure 6.1

6.4.1 General Setting Menu

From this menu the user can change frequency, set the deviation display modality and change the IIC address.



Menu 4

F1 Regulation of set up frequency. After having set a new frequency value, press the ENCODER to confirm the choice. The receiver will release from the current frequency (the LOCK LED turns off) and it will latch onto the new operating frequency (LOCK turns back on). Instead, if you let the timeout go by, the frequency will remain set at the previous value.

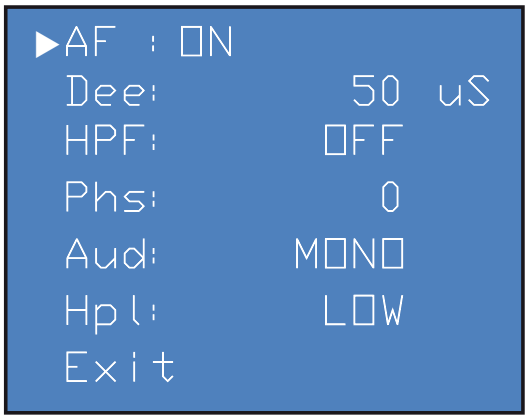
Mod — Display modality of the modulation selectable between x1 and x10. The indication of the instantaneous deviation is multiplied by a factor 10 in the x10 mode, so the hatched indicator on the predefined menu will coincide with the 7.5 kHz value instead of 75 kHz. This display mode is useful when you want to view low deviation levels such as, for example, those due to the pilot tone or to the subcarriers.

IIC — Regulation of the I²C address. The I²C network address is important when the transmitter is connected to a company's transmission system that envisages use of this protocol. We recommend you do not modify it without a good reason.

Exit — The entry allows to the user the prompt exit from current submenu and goes back to the "Main Menu".

6.4.2 Audio Setting Menu

This menu lets to enable or disable audio ouput and the HPF filter and to set the deemphasis, the phase of audio signal , the audio and headphones modality.



Menu 5

AF — Enables (On) or disables (Off) the audio ouputs of the receiver.

Dee — Regulation of the deemphasis, selectable between 0 µs, 50 µs and 75 µs.

HPF — Enables (On) or disables (Off) the HPF filter.

Phs — Regulation of the phase of audio signal, selectable between 0 and 180.

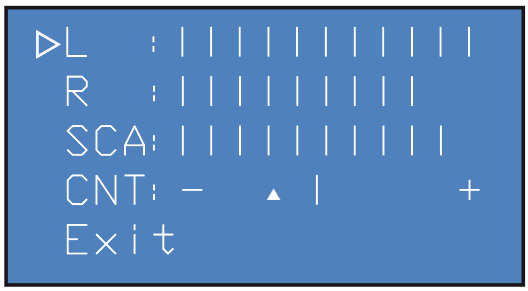
Aud — Regulation of audio modality selectable between STEREO and MONO.

HPL — Regulation of headphones level selectable between OFF, LOW, MIDDLE, HIGH, and MAX.

Exit — The entry allows to the user the prompt exit from current submenu and goes back to the "Main Menu".

6.4.3 Levels Meter Menu

The Right, Left and SCA channel output levels are depicted with horizontal bars, as shown in the following figure. The hatched pointer indicates the level that corresponds with the total deviation at 100%, and is useful to regulate the output levels of the audio channels.

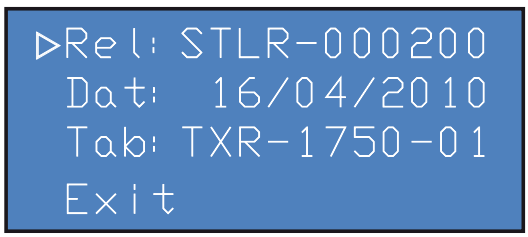


Menu 6

L	Visualization of the Left channel Vmeter.
R	Visualization of the Right channel Vmeter.
SCA	Visualization of the Left channel Vmeter.
CNT	Visualization of the shift of the received signal compared to center-channel.
Exit	The entry allows to the user the prompt exit from current submenu and goes back to the “Main Menu”.

6.4.4 About Version Menu

This screen shows the version and the release date of the software.



Menu 7

Rel	Visualization of the software release.
Dat	Visualization of the date release.
Tab	Visualization of the release of the configurations table loaded in memory.
Exit	The entry allows to the user the prompt exit from current submenu and goes back to the “Main Menu”.

7. Identification and Access to the Modules

7.1 Identification of the Modules

The **PTRLNV/4 & RXRLNV/4** is made up of various modules linked to each other through connectors so as to make maintenance and any required module replacement easier.

7.1.1 PTRLNV/4 Upper View (1.3÷1.7 GHz Version)

The figure below shows the equipment upper view with the various components pointed out.

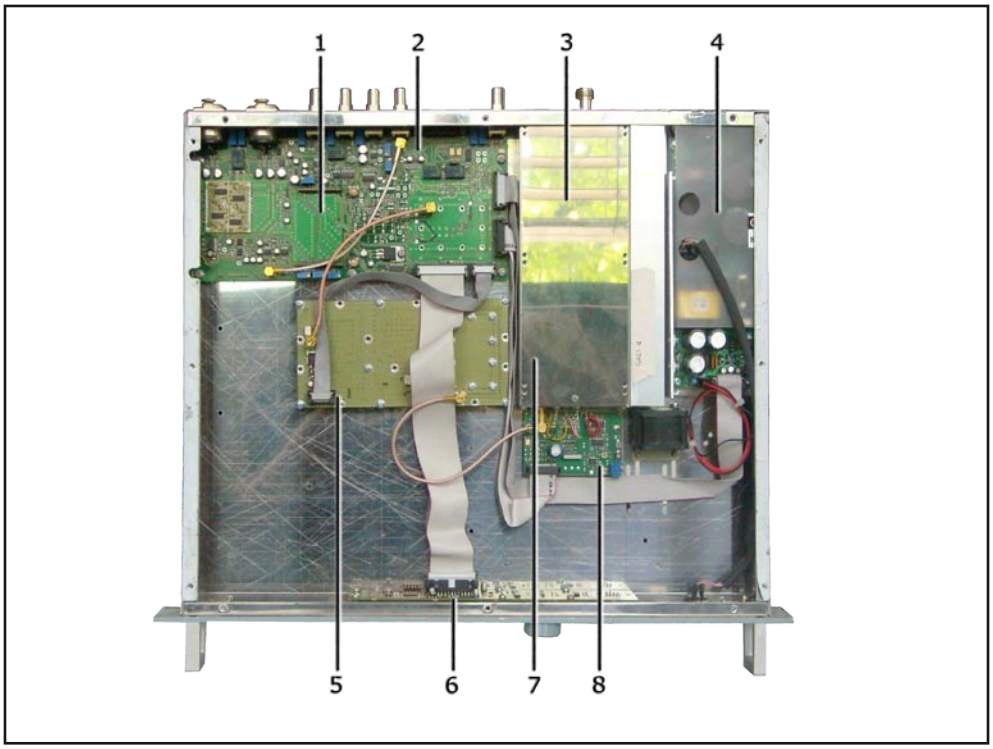


figure 7.1

[1] **/S-PTNV4** Stereo Coder Card Option (**SLCTC30V03**)
[2] MainBoard (**SL040MA2002**)
[3] RF Module Card (**SL040RF2001**)
[4] Power Supply (**PS24185UIBL2**)
[5] 1500-1525 MHz VCO/PLL Card (**SL040VC1101** [**RIS753MHZ**])
1650-1680 MHz VCO/PLL Card (**SL040VC1001** [**RIS800MHZ**])
1675-1725 MHz VCO/PLL Card (**SL040VC1001** [**RIS800MHZ**])
1700-1750 MHz VCO/PLL Card (**SL040VC1301** [**RIS850MHZ**])
1750-1800 MHz VCO/PLL Card (**SL040VC1201** [**RIS900MHZ**])
[6] Panel Card (**SL040PC1001**)
[7] Driver & Power Amplifier Card (**SL040DR1001**)
[8] RF Control Card (**SL037BI1004**)

7.1.2 PTRLNV/4 Upper View (2.3÷2.4 GHz Version)

The figure below shows the equipment upper view with the various components pointed out.

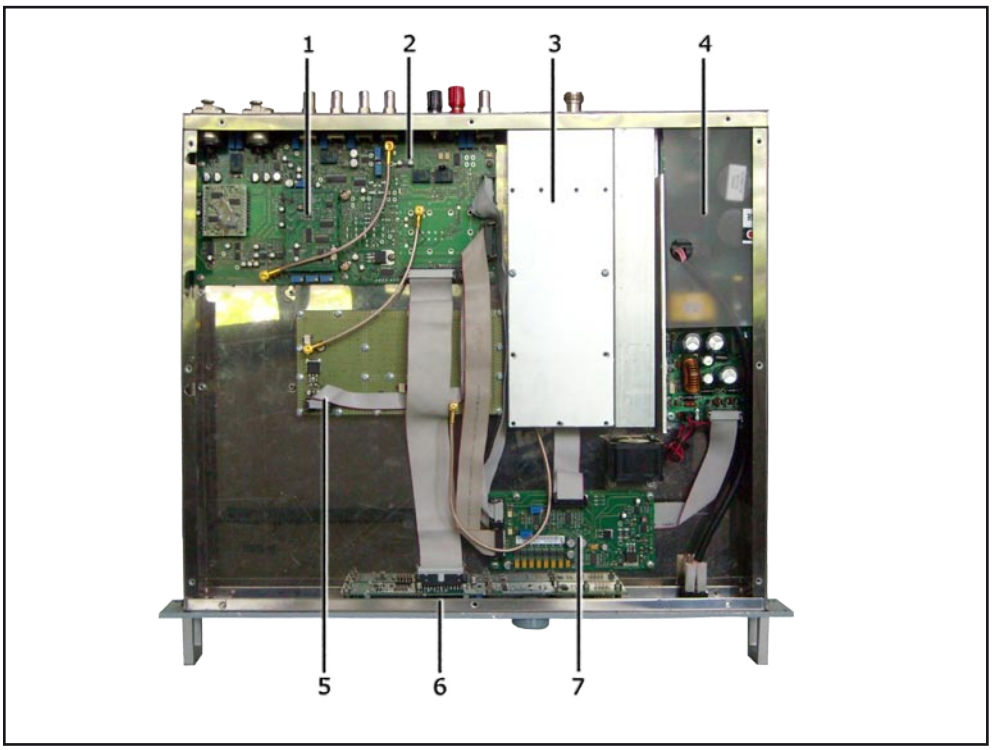


figure 7.2

[1] **/S-PTNV4** Stereo Coder Card Option (**SLCTC30V03**)
[2] MainBoard (**SL040MA2002**)
[3] RF Module Card (**SL040RF1001**)
[4] Power Supply (**FLYPTRL1U**)
[5] 2368-2372 MHz VCO/PLL Card (**SL040VC1001** [**RIS800MHZ**])
2440-2450 MHz VCO/PLL Card (**SL040VC1001** [**RIS800MHZ**])
2468-2483 MHz VCO/PLL Card (**SL040VC1001** [**RIS800MHZ**])
[6] Panel Card (**SL040PC1001**)
[7] Bias Card (**SL040BI2002**)

7.1.3 RXRLNV/4 Upper View (1.3÷1.7 & 2.3 ÷ 2.4 GHz Version)

The figure below shows the equipment upper view with the various components pointed out.

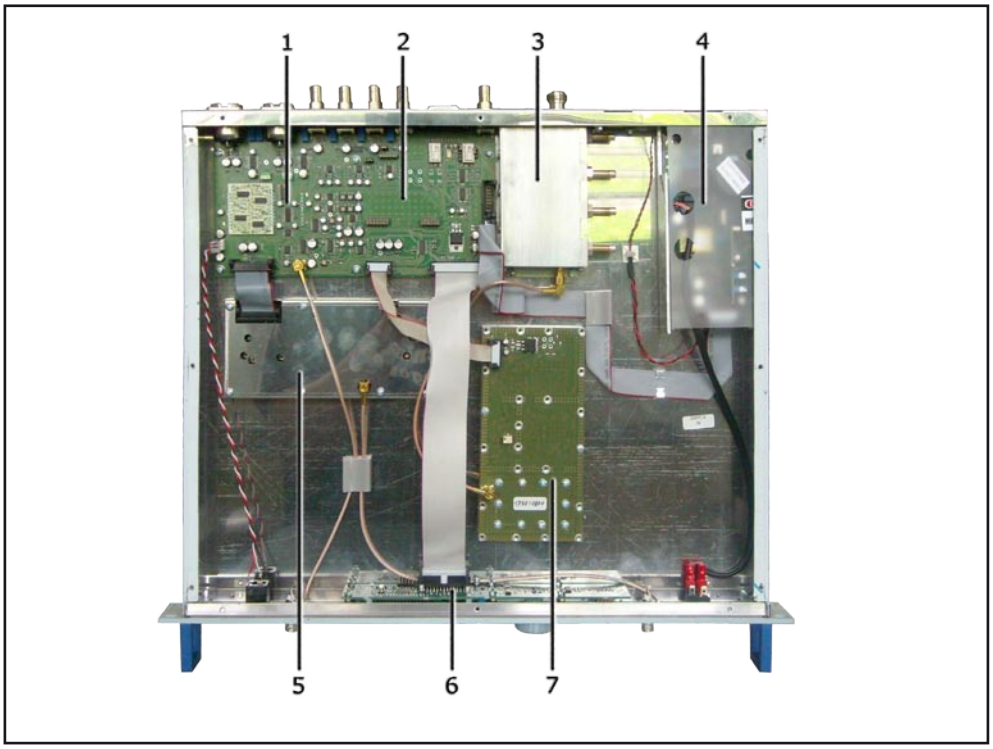


figure 7.2

[1] **/05-RXRLNV4** Stereo Decoder Card Option (**SLDECMDLCD01**)
[2] MainBoard (**SL040MA1002**)
[3] 1500-1525 MHz Input Filter block (**K040CAV1G7**)
1650-1680 MHz Input Filter block (**K040CAV1G7**)
1675-1725 MHz Input Filter block (**K040CAV1G7**)
1700-1750 MHz Input Filter block (**K040CAV1G7**)
1750-1800 MHz Input Filter block (**K040CAV1G7**)
2368-2372 MHz Input Filter block (**K040CAV2M4**)
2440-2450 MHz Input Filter block (**K040CAV2M4**)
2468-2483 MHz Input Filter block (**K040CAV2M4**)
[4] Power Supply (**FLYRXRL1U**)
[5] RF/IF Converter Card (**SL040IF2002**)
[6] Panel Card (**SL040PC1101**)
[7] 1500-1525 MHz VCO/PLL Card (**SL040VC2101** [**RIS753MHZ**])
1650-1680 MHz VCO/PLL Card (**SL040VC2001** [**RIS800MHZ**])
1675-1725 MHz VCO/PLL Card (**SL040VC2001** [**RIS800MHZ**])
1700-1750 MHz VCO/PLL Card (**SL040VC2001** [**RIS800MHZ**])
1750-1800 MHz VCO/PLL Card (**SL040VC2201** [**RIS850MHZ**])
2368-2372 MHz VCO/PLL Card (**SL040VC2001** [**RIS800MHZ**])
2440-2450 MHz VCO/PLL Card (**SL040VC2001** [**RIS800MHZ**])
2468-2483 MHz VCO/PLL Card (**SL040VC2001** [**RIS800MHZ**])

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